

IN THE CLAIMS:

Specific Instructions for Claim Amendments

Please cancel Claims 1-23, without prejudice to or disclaimer of the subject matter therein.

Please add the following new Claims 24-46.

Listing of Claims

1-23. (Cancelled)

24. (New) A cysteine variant of erythropoietin corresponding to at least amino acids 1-165 of SEQ ID NO:2, wherein a cysteine residue is inserted preceding the first amino acid of erythropoietin; wherein said variant has biological activity *in vitro* as measured by proliferation of a cell line that proliferates in response to erythropoietin.

25. A cysteine variant of erythropoietin corresponding to amino acids 1-166 of SEQ ID NO:2, wherein a cysteine residue is inserted following the last amino acid of erythropoietin; wherein said variant has biological activity *in vitro* as measured by proliferation of a cell line that proliferates in response to erythropoietin.

26. A cysteine variant of erythropoietin corresponding to at least amino acids 1-165 of SEQ ID NO:2, wherein a cysteine residue is inserted between at least one pair of two adjacent amino acids located in at least one region of erythropoietin selected from the group consisting of: the A-B loop corresponding to amino acids 23-58 of SEQ ID NO:2, the B-C loop corresponding to amino acids 77-89 of SEQ ID NO:2, the C-D loop corresponding to amino acids 108-131 of SEQ ID NO:2, the first three or last three amino acids in helix A, the first three or last three amino acids in helix B, the first three or last three amino acids in helix C, the first three or last three amino acids in helix D, the region preceding helix A corresponding to amino acids 1-8 of SEQ ID NO:2, and the region following helix D corresponding to amino acids 153-165 or 153-166 of SEQ ID NO:2;

wherein said variant has biological activity *in vitro* as measured by proliferation of a cell line that proliferates in response to erythropoietin.

27. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acid located in the region of erythropoietin preceding helix A.

28. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acids located in the region of erythropoietin following helix D.

29. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acids located in the A-B loop of erythropoietin.

30. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acids located in the B-C loop of erythropoietin.

31. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acid located in the C-D loop of erythropoietin.

32. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acids located in at least one region of erythropoietin selected from the group consisting of the first three amino acids in helix A and the last three amino acids in helix A.

33. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acids located in at least one region of erythropoietin selected from the group consisting of the first three amino acids in helix B and the last three amino acids in helix B.

34. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acids located in at least one region of erythropoietin selected from the group consisting of the first three amino acids in helix C and the last three amino acids in helix C.

35. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between two adjacent amino acids located in at least one region of erythropoietin selected from the group consisting of the first three amino acids in helix D and the last three amino acids in helix D.

36. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between the region preceding helix A and the first three amino acids in helix A.

37. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between the A-B loop and the last three amino acids in helix A.

38. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between the A-B loop and the first three amino acids in helix B.
39. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between the B-C loop and the last three amino acids in helix B.
40. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between the B-C loop and the first three amino acids in helix C.
41. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between the C-D loop and the last three amino acids in helix C.
42. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between the C-D loop and the first three amino acids in helix D.
43. The cysteine variant according to claim 26, wherein a cysteine residue is inserted between the last three amino acids of helix D and the region following helix D.
44. The cysteine variant according to any one of claims 24-26, wherein the inserted cysteine residue is modified with a cysteine-reactive moiety.
45. The cysteine variant according to any one of claims 24-26, wherein the inserted cysteine residue is modified with polyethylene glycol.
46. The cysteine variant according to any one of claims 24-26, wherein said cysteine variant is modified with at least one polyethylene glycol.